

present invention may be practiced without some or all of these specific details. In other instances, well known process steps and/or structures have not been described in detail in order to not unnecessarily obscure the present invention.

**[0021]** Gaming machine manufacturers highly regard customer preference information. When the assignee introduced CRT-based slot machines in 1975, the reaction of some players was less than enthusiastic. The CRT screens jolted players from a gaming activity based on a complex mechanical apparatus to a single, flat, video screen. The technology of 1975 pales in comparison to that of today. And yet, amongst casino patrons and other players, the perceived value of mechanically driven reel slot machines remains high.

**[0022]** Customer preference information belonging to the assignee shows that players trust the old mechanical machines. Some players feel that a lack of mechanically driven reels causes a slot game to be cheapened—and somehow less random. Many players believe that it is impossible to externally tamper with or (to player detriment) control outcomes for a mechanically driven machine. These people also commonly believe that manipulating outcomes portrayed on a video screen is both easily accomplished and undetectable to a player. A loyal base of players still favors the traditional mechanical stepper machines, even today.

**[0023]** The gradual disappearance of mechanical gaming machines, however, has left admirers of mechanical steppers scrambling to find their preferred machines.

**[0024]** Described herein are processor-based gaming machines that realistically emulate a mechanical reel machine. The gaming machine includes a number of adaptations, such as audio, video and/or physical adaptations, where each contributes to the perception of a mechanically driven reel slot machine. Specific embodiments described herein provide video data, for output on a video display device, that simulates visible mechanical imperfections of a mechanical reel in a gaming machine. Several of these visible mechanical imperfections and simulations are described in further detail below with respect to FIGS. 1-3.

**[0025]** Before describing these embodiments, it is useful to differentiate between three types of reels in a gaming machine: mechanical reels, two-dimensional (2-D) video reels, and realistic video simulation of mechanical reels as described herein.

**[0026]** Mechanical reels refer to the traditional hardware reels, with their associated latches and various mechanical parts. A mechanical reel usually has a set number of symbols disposed about a circumference of a reel strip attached to a wheel. A motor, spring, or other mechanical system physically spins the wheel until it stops at a rotational position and a particular symbol rests in view of a player to indicate an outcome for the reel game. In many older machines, the reels and symbols were spun by potential energy first stored in a spring-loaded mechanism wound and then actuated by the pull of a traditional pull-arm handle. Each reel was stopped at a random position by a mechanical device. The gaming machine senses an outcome, along a central payline, by sensing the position of each reel.

**[0027]** 2-D video reels refer to the use of cartoonish animations that caricature reels in a single 2-D video device. The cartoonish animations do not intend to realistically portray actual mechanical reels, nor do they.

**[0028]** Realistic video simulation of mechanical reels, using embodiments described herein, refers to 2-D and/or 3-D hardware and/or software attempts to emulate actual

mechanical reels. Their goal is to have a player perceive a real mechanical reel, at least partially. In particular, embodiments described herein contribute to the perception of a mechanically driven reel slot machine by simulating visible mechanical imperfections in a mechanical machine. Other video adaptations that emulate actual mechanical reels are also suitable for use. Briefly, these other video adaptations may include: outward bowing of video reel edges to simulate the curvature of an actual circular mechanical reel, variable fore-lighting of video reel displays to simulate real reel curvature and out of plane perception, backlight blinking of video reel symbols to simulate lighting used in mechanical systems, etc. Other video adaptations are also suitable for use.

**[0029]** The embodiments described herein use video to simulate one theme of real mechanical reels in a gaming machine: their imperfections. Old mechanical reel-based gaming machines have numerous mechanical imperfections, and many of these imperfections are visibly perceivable. As the inventor discovered, these imperfections can be leveraged by a digital-based machine to add to the realism perceived by a person who is near a processor-based machine.

**[0030]** Traditional mechanical reels move imperfectly. Rather than diminishing user experience, however, the quirky and imperfect nature of these machines quickly became one of their most desirable and endearing characteristics. The perceived mechanical imperfections often differed between machines; frequent players would often associate a personality with each machine based on its imperfections. Given each machine's unique personality, frequent players felt they could 'pick winning machines' because they could intuitively sense differences between the machines. The players would often select a machine that 'felt lucky' to them—or a machine that was 'hot'. Also, the perceivable mechanical imperfections and visible variations in physical performance reinforced a notion in the minds of players that the gaming outcomes were truly random events—derived from an imperfect machine that could not be controlled or manipulated to their detriment. Many people trusted the old mechanical slot machines more. The resultant player loyalty has helped the mechanical machines persist in the gaming industry, despite their cost disadvantages relative to processor-based machines.

**[0031]** FIGS. 1-3, 5A and 5B describe embodiments that include video data configured to simulate visible mechanical imperfections of a mechanical reel in a gaming machine.

**[0032]** In addition to video adaptations, a gaming machine as described herein attempting to emulate a mechanically driven reel slot machine may also include contributions from other sources. The gaming machine may include a combination of audio, video and/or physical adaptations.

**[0033]** Audio adaptations may include: stereo audio that varies output audio based on video reel position in the gaming machine (e.g., audio for a left video reel is output and increasingly heard on a left side of a digital machine, while audio for a right video reel is increasingly heard on the right side of the machine), stereo recording and playback of actual mechanical sounds in a real mechanical reel machine, randomization of the actual mechanical sounds to avoid repetition of the same sounds, etc. Other audio adaptations are also suitable for use.

**[0034]** Physical adaptations may include the use of layered video displays with a set distance between the displays. Traditional mechanical reel gaming machines arranged the mechanical reels behind a glass layer. The glass layer was arranged proximate to a player standing in front of the